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Date	Client/Matter Number
June 7, 2007	NECW 20.531 (100806-00222)
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**Comments**

10 pages - AMENDMENT

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Frances Doyle

Attorney Docket No.: NECW 20.531 (100806-00222)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Tomoki NOBUTA et al.  
Serial No.: 10/634,607  
Filed: August 5, 2003  
Title: **CELL ELECTRODE AND ELECTROCHEMICAL CELL THEREWITH**  
Examiner: Laura S. Weiner  
Group Art Unit: 1745  
Confirmation No.: 6611

June 7, 2007

Mail Stop Amendment  
Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

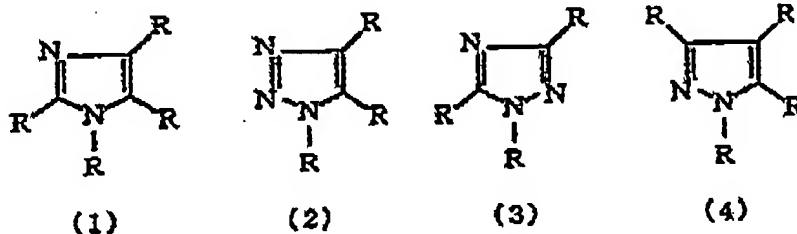
AMENDMENT

SIR:

In response to the non-final Office Action mailed on March 8, 2007, Applicant hereby amends the application as follows:

**AMENDMENTS TO THE CLAIMS:**

1. (Currently Amended) An electrode for an electrochemical cell, comprising:  
 an electrode material including an active material having a proton-conducting compound  
 and a nitrogen-containing heterocyclic compound;  
 wherein the nitrogen-containing heterocyclic compound is one or more compounds selected from  
 the group consisting of imidazole, triazole, pyrazole, and their derivatives; and or its derivative  
represented by formula (1), triazole or its derivative represented by formula (2) or (3), and  
pyrazole or its derivative represented by formula (4):



wherein R independently represent hydrogen, alkyl having 1 to 4 carbon atoms, amino,  
carboxyl, nitro, phenyl, vinyl, halogen, acyl, cyano, trifluoromethyl, alkylsulfonyl or  
trifluoromethylthio; and

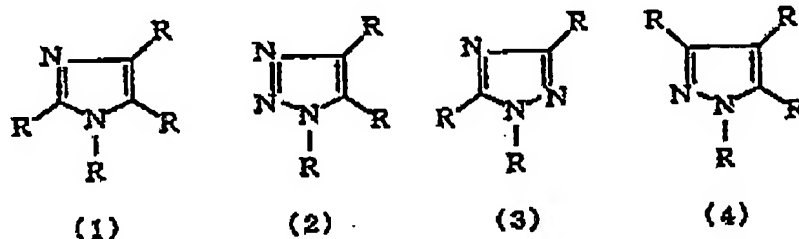
wherein said electrode comprises 1 to 80 parts by weight of the nitrogen-containing  
 heterocyclic compound to 100 parts by weight of the active material.

2. (Currently Amended) ~~The cell electrode as claimed in Claim 1 wherein the electrode material comprises the~~ An electrode for an electrochemical cell comprising;

an electrode material including an active material having a proton-conducting compound and a nitrogen-containing heterocyclic compound;

wherein said proton-conducting compound comprises a nitrogen-containing heterocyclic compound and a polymer having a unit containing a nitrogen-containing heterocyclic moiety;

wherein the nitrogen-containing heterocyclic compound is one or more compounds selected from the group consisting of imidazole or its derivative represented by formula (1), triazole or its derivative represented by formula (2) or (3), and pyrazole or its derivative represented by formula (4):



wherein R independently represent hydrogen, alkyl having 1 to 4 carbon atoms, amino, carboxyl, nitro, phenyl, vinyl, halogen, acyl, cyano, trifluoromethyl, alkylsulfonyl or trifluoromethylthio; and

wherein said electrode comprises 1 to 80 parts by weight of the nitrogen-containing heterocyclic compound to 100 parts by weight of the active material.

3.-9. (Canceled)

**10. (Original)** The cell electrode as claimed in Claim 2 comprising 1 to 80 parts by weight of the nitrogen-containing heterocyclic compound and the polymer to 100 parts by weight of the active material.

**11. (Previously Presented)** An electrochemical cell having a positive electrode including a proton-conducting compound and a negative electrode including a proton-conducting compound, wherein at least one of the electrodes is the electrode as claimed in Claim 1.

**12. (Original)** An electrochemical cell as claimed in Claim 11 comprising an electrolyte containing a proton source wherein only protons act as a charge carrier in a redox reaction in both electrodes associated with charge and discharge.

**13. (Original)** A secondary battery comprising the electrochemical cell as claimed in Claim 11.

**14-18. (Canceled)**

**19. (Previously Presented)** A secondary battery comprising an electrochemical cell having at least two electrodes:

wherein at least two of the electrodes of the electrochemical cell comprise an electrode material including an active material having a proton-conducting compound;

wherein at least one electrodes of the electrochemical cell comprises an electrode material including a nitrogen-containing heterocyclic compound;

wherein the nitrogen-containing heterocyclic compound comprises one or more compounds selected from the group consisting of imidazole, triazole, pyrazole, and their derivatives; and

wherein said electrode material comprises the nitrogen-containing heterocyclic compound and a polymer having a unit containing a nitrogen-containing heterocyclic moiety.

**20.-22. (Canceled)**

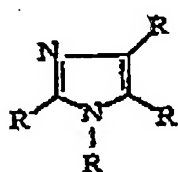
**23. (Currently Amended)** An electrochemical cell, comprising:

a negative electrode including an active material having a proton-conducting compound and a nitrogen-containing heterocyclic compound, the negative electrode being formed on a negative current collector;

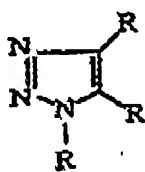
a positive electrode;

a separator separating the positive electrode and the negative electrode;

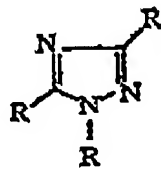
wherein the nitrogen-containing heterocyclic compound is one or more compounds selected from the group consisting of imidazole, triazole, pyrazole, and their derivatives or its derivative represented by formula (1), triazole or its derivative represented by formula (2) or (3), and pyrazole or its derivative represented by formula (4):



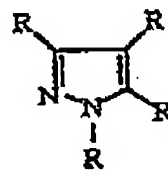
(1)



(2)



(3)



(4)

wherein R independently represent hydrogen, alkyl having 1 to 4 carbon atoms, amino, carboxyl, nitro, phenyl, vinyl, halogen, acyl, cyano, trifluoromethyl, alkylsulfonyl or trifluoromethylthio; and

wherein the negative electrode comprises 1 to 80 parts by weight of the nitrogen-containing heterocyclic compound to 100 parts by weight of the active material.

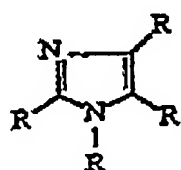
**24. (Currently Amended)** An electrochemical cell, comprising:

a positive electrode including an active material having a proton-conducting compound and a nitrogen-containing heterocyclic compound, the positive electrode being formed on a positive current collector;

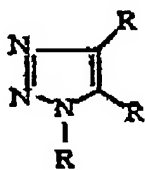
a negative electrode;

a separator separating the positive electrode and the negative electrode;

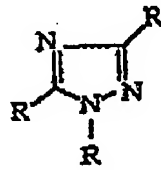
wherein the nitrogen-containing heterocyclic compound is one or more compounds selected from the group consisting of imidazole, ~~triazole, pyrazole, and their derivatives~~ or its derivative represented by formula (1), triazole or its derivative represented by formula (2) or (3), and pyrazole or its derivative represented by formula (4):



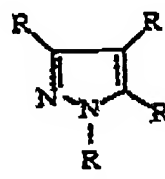
(1)



(2)



(3)



(4)

wherein R independently represent hydrogen, alkyl having 1 to 4 carbon atoms, amino, carboxyl, nitro, phenyl, vinyl, halogen, acyl, cyano, trifluoromethyl, alkylsulfonyl or trifluoromethylthio; and

wherein the positive electrode comprises 1 to 80 parts by weight of the nitrogen-containing heterocyclic compound to 100 parts by weight of the active material.

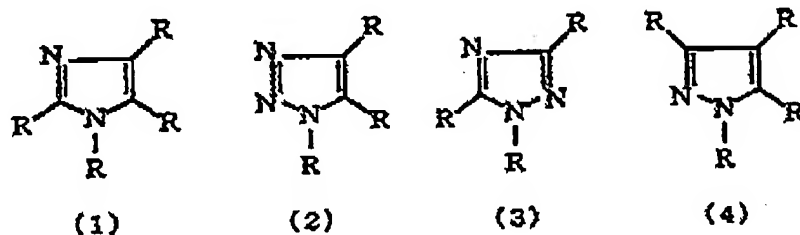
25. (Currently Amended) An electrochemical cell, comprising:

an electrode material including an active material having a proton-conducting compound and a nitrogen-containing heterocyclic compound;

wherein only protons act as a charge carrier in a redox reaction in both electrodes associated with charge and discharge;

wherein the electrochemical cell comprises an electrolyte containing a proton source, and wherein only adsorption and desorption of protons in the electrode active material is involved in electron transfer in a redox reaction in both electrodes associated with charge and discharge;

wherein the nitrogen-containing heterocyclic compound is one or more compounds selected from the group consisting of imidazole, triazole, pyrazole, and their derivatives or its derivative represented by formula (1), triazole or its derivative represented by formula (2) or (3), and pyrazole or its derivative represented by formula (4);





wherein R independently represent hydrogen, alkyl having 1 to 4 carbon atoms, amino, carboxyl, nitro, phenyl, vinyl, halogen, acyl, cyano, trifluoromethyl, alkylsulfonyl or trifluoromethylthio;  
and

wherein the electrode material comprises 1 to 80 parts by weight of the nitrogen-containing heterocyclic compound to 100 parts by weight of the active material.

26. (New) An electrochemical cell having a positive electrode including a proton-conducting compound and a negative electrode including a proton-conducting compound, wherein at least one of the electrodes is the electrode as claimed in Claim 2.

27. (New) The electrochemical cell as claimed in Claim 26 comprising an electrolyte containing a proton source wherein only protons act as a charge carrier in a redox reaction in both electrodes associated with charge and discharge.

28. (New) The electrochemical cell as claimed in Claim 26, wherein the electrochemical cell is arranged in a secondary battery.

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### REMARKS

Claims 1-5, 8, 10-13, and 17-25 are pending in the present application. Via this amendment, Claims 1, 2, 23-25 are amended, Claims 3, 4, 5, 8, 17, 18, 20, 21, and 22 are canceled, and new Claims 26, 27, and 28 have been added. Support for new Claims 26-27 is found in the specification at page 10, lines 5-24 to page 15, line 25. Support for new Claim 28 is found at page 26, lines 9-14. No new matter is added by the amendments. In view of the amendments and the following remarks, favorable reconsideration of this case is respectfully requested.

Applicants note with appreciation that the Examiner has identified allowable subject matter. Claims 2, 5, 10, 20-22 are objected to but would be directed to patentable subject matter if rewritten in independent form. Claim 19 is allowed.

Claims 3, 4, 8, and 17-18 are rejected under 35 U.S.C. 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Via this amendment, Claims 3, 4, 8, 17 and 18 have been deleted thereby rendering the 35 U.S.C. 112, second paragraph rejection moot.

Claims 1, 3-4, 8, 11-13, 17-18, 23-25 were rejected under 35 U.S.C. 102(b) as anticipated by JP 3-182051 to Shinozaki, *et al.* (hereinafter "Shinozaki").


Applicants respectfully disagree with the Examiner. However, to advance prosecution of this case, Applicants have cancelled Claims 5, 20, 21 and 22 herein. Additionally, Claims 1, 23, 24 and 25 have been amended to incorporate the features of allowable Claim 5. Therefore, the 35 U.S.C. 102(b) rejection is rendered moot.

Claims 1, 23, 24 and 25 include the features of Claim 5 and are, therefore, allowable for at least the same reasons as Claim 5 is allowable. Claim 2 has been amended to include the features of Claim 1 and is allowable for at least the reasons Claim 1 is now allowable.

In view of the remarks set forth above, this application is believed to be in condition for allowance, which action is respectfully requested. However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged to Deposit Account No. 50-1290.

Respectfully submitted,

  
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CUSTOMER NO.: 026304

Attorney Docket No.: NECW 20.531 (100806-00222)  
MMR:fd